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Short communication

First record of Pontian monkey goby, *Neogobius fluviatilis* (Pallas, 1814), in the Dutch Rhine

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Abstract

The Pontian monkey goby, *Neogobius fluviatilis*, was recorded for the first time in the Netherlands in March 2009. Seven specimens were caught in the lower parts of the River Rhine, at close distance of the German border. Based on the species invasive history, *N. fluviatilis* could become invasive. Potential ecological impacts should therefore be studied.

Key words: invasive species, gobiid, Netherlands, Pontische stroomgrondel, *Neogobius kessleri*

At 11 and 12 March 2009 three specimens of the Pontian monkey goby *Neogobius fluviatilis* (Pallas, 1814) (Figure 1), were caught in the Dutch part of the Rhine system, the river Waal. This is the first record of the species in the Netherlands. The Dutch name 'Pontische stroomgrondel' was given to the species by the authors. Monkey goby is the fourth Ponto-Caspian gobiid species that reached the Netherlands. Previously, Western tubenose goby *Proterorhinus semilunaris* (Heckel, 1937) settled in the Dutch Rhine system in 2002 (data Rijkswaterstaat - Waterdienst), round goby *Neogobius melanostomus* (Pallas, 1814) in 2004 (van Beek 2006) and bighead goby *Neogobius kessleri* (Günther, 1861) in 2007 (unpublished data).

In the Netherlands, a yearly survey program 'Active Freshwater Fish Monitoring' is being conducted in all major Dutch rivers since 1997. Within this program, various parts of the Dutch Rhine system are being monitored by means of electrofishing and bottom trawling in permanent transects. The specimens of *N. fluviatilis* were caught in transects by bottom-trawling (net entrance width 3 m; 15 mm stretched mesh size; 10 min trawling time at 3-4 knots), during the spring survey in March 2009. Water temperature of the transects was measured with a thermometer attached to the bottom of the research vessel 'Schollevaar' at a water depth of 1,40 m.

The first specimens of *N. fluviatilis* (n=3) were caught in the river Waal in one transect at a water depth of 5 m that was located directly in front of a cooling water outlet of an electric power-plant in the vicinity of the city of Nijmegen (51°51'47.10"N, 5°49'51.57"E; Figure 2). In comparison with average river water temperature of all other transects in the river Waal, water temperature along this transect was higher (7°C), in comparison with average river water temperature of all other transects in the river Waal (5°C). At 19, 25 and 26 March, four

other specimens of *N. fluviatilis* were caught in three other transects in the river Waal (Figure 2). Water temperature of these transects was not elevated in comparison with average river water temperature. Total length of the collected specimens ranged from 77 - 110 mm. *N. fluviatilis* was only caught by means of bottom trawling.

On 12 May 2009, an additional specimen was caught in the river Boven Merwede, which is the western part of the river Waal, approximately 70 km downstream of the location of the first observation described above (Figure 2; M. Soes, pers. comm.). Total length of this specimen was 112 mm. Other information was not provided.

Figure 1. First specimen of *Neogobius fluviatilis* caught in the river Waal (11 March 2009, photo M. Dorenbosch)

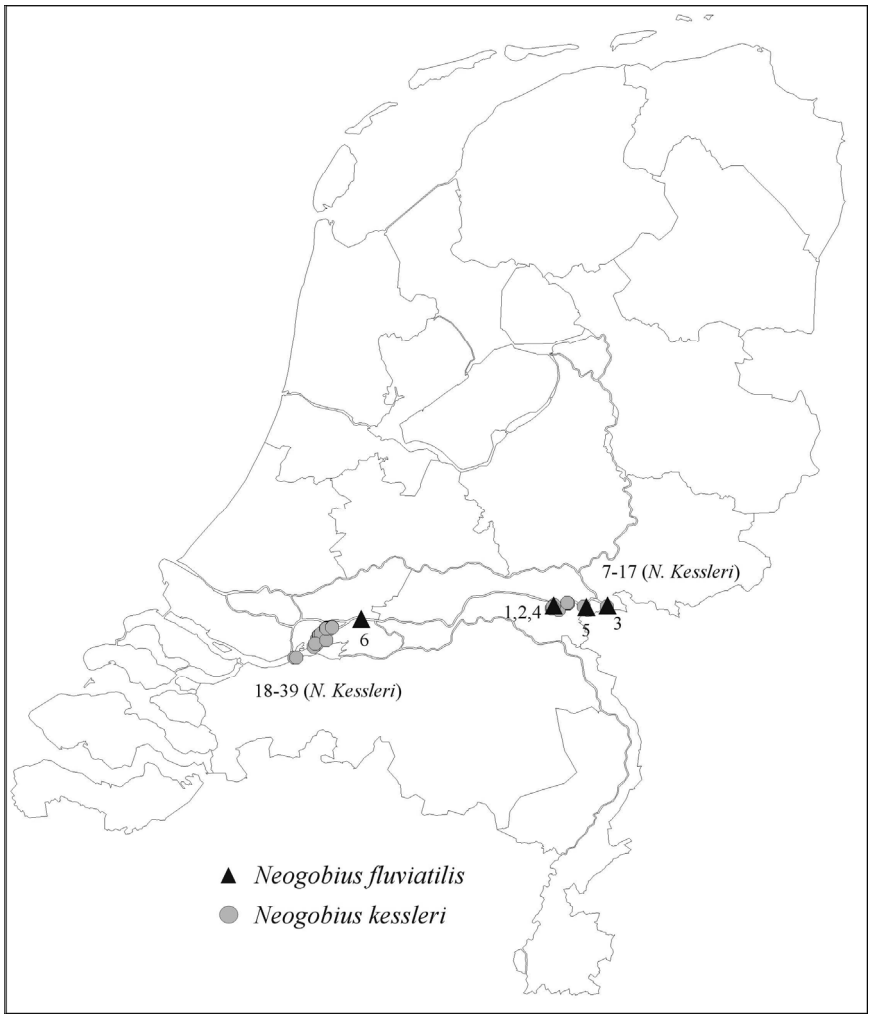

Figure 2. Distribution of *Neogobius fluviatilis* and *N. kessleri* in the lower part of the Rhine in the Netherlands (data: Rijkswaterstaat - Waterdienst 2008-2009; pers. comm. M. Soes). See Annex 1 for record data

N. fluviatilis distinguishes from other freshwater gobiid species by the following characteristics (Kottelat and Freyhof 2007; Pinchuk et al. 2003): (1) the second dorsal fin is uniformly lowering down from the first rays to the last ones; (2) the first branched ray of the second dorsal fin is about twice as long as the penultimate ray; (3) the pelvic disc is elongated, with poorly visible lobes at the edges of the membrane, (3) the lack of a black spot in the posterior part of the first dorsal fin.

The native distribution of *N. fluviatilis* includes the Azov and Black Sea basin in the Ponto-Caspian region. It became invasive in rivers of the Northern Black Sea basin since 1970 and was first discovered as an invasive species in 1970 in Lake Balaton, Hungary (Biró 1972). In 1984 the species was collected from the lower Hungarian stretch of the river Danube (Pintér 1989). In 2001 *N. fluviatilis* was collected in the Slovak-Hungarian section of the Danube (Stráňai and Andeji 2001), and in 2003 it was caught in the river Raba, near to the river Danube (G. Guti, pers. comm. in Harka and Biró 2007) at the border of Austria. In 2008 the species was collected in the harbour of Duisburg, Germany (J. Freyhof, pers. comm.). Subsequently, the species was first observed in the Netherlands in 2009.

Until now, seven specimens of *N. fluviatilis* were caught in the river Waal and one specimen in the river Boven Merwede. This indicates that the species is most likely settling in the Dutch river fish fauna at present. Based on earlier observations in European rivers as mentioned above, it is likely the species becomes invasive in Dutch rivers.

A comparable settlement pattern has been observed for the bighead goby that colonised the Dutch Rhine system in 2007, and by now occurs widely in the system (Figure 2). It could be possible that monkey goby will display a similar settlement pattern. However, Juradja et al. (2005) showed that in contrast to the invasiveness of bighead goby in the Slovak part of the river Danube, monkey goby did not achieve the same high densities. Although both species are rheophilic, habitat preferences of monkey goby are different from bighead goby, sandy or fine substrata and gravel or larger substrata (Erős 2005), respectively. Since habitats with sandy or fine substrata are abundant in the Dutch Rhine system, monkey goby may display a fast dispersal, as has been observed for bighead goby (Figure 2). Possible ecological impacts of the species should therefore be studied.

Acknowledgements

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Annex 1
Records of *Neogobius fluviatilis* and *N. kessleri* in the Netherlands. References: Rijkswaterstaat - Waterdienst (Site No. 1-5 and 7-39) and M. Soes (Site No. 6)

Site No. (Map Ref.)	River	Record date	Record coordinates		Species	Number collected
			Latitude, °N	Longitude, °E		
1	Waal	11 March 2009	51°51'47"	5°49'52"	*Neogobius fluviatilis*	1
2	Waal	12 March 2009	51°51'47"	5°49'52"	*Neogobius fluviatilis*	2
3	Rijn	19 March 2009	51°51'44"	6°04'41"	*Neogobius fluviatilis*	2
4	Waal	25 March 2009	51°51'47"	5°49'53"	*Neogobius fluviatilis*	1
5	Waal	26 March 2009	51°51'29"	5°58'52"	*Neogobius fluviatilis*	1
6	Boven Merwede	12 May 2009	51°49'33"	4°56'41"	*Neogobius fluviatilis*	1
7	Waal	26 March 2008	51°51'51"	5°49'59"	*Neogobius kessleri*	1
8	Waal	27 March 2008	51°52'08"	5°53'45"	*Neogobius kessleri*	1
9	Waal	13 March 2008	51°51'19"	5°49'18"	*Neogobius kessleri*	1
10	Waal	12 March 2009	51°51'02"	5°51'13"	*Neogobius kessleri*	2
11	Waal	12 March 2009	51°51'33"	5°58'07"	*Neogobius kessleri*	4
12	Waal	11 March 2009	51°51'26"	5°49'28"	*Neogobius kessleri*	3
13	Waal	11 March 2009	51°51'53"	5°49'57"	*Neogobius kessleri*	1
14	Waal	25 March 2009	51°51'35"	5°49'32"	*Neogobius kessleri*	1
15	Waal	11 March 2009	51°52'11"	5°53'46"	*Neogobius kessleri*	1
16	Waal	11 March 2009	51°52'16"	5°53'32"	*Neogobius kessleri*	1
17	Rijn	18 March 2008	51°51'31"	6°04'29"	*Neogobius kessleri*	1
18	Nieuwe Merwede	21 Oct. 2008	51°46'43"	4°45'41"	*Neogobius kessleri*	9
19	Nieuwe Merwede	22 Oct. 2008	51°47'51"	4°48'51"	*Neogobius kessleri*	9
20	Nieuwe Merwede	22 Oct. 2008	51°47'58"	4°47'12"	*Neogobius kessleri*	2
21	Nieuwe Merwede	22 Oct. 2008	51°46'00"	4°44'33"	*Neogobius kessleri*	3
22	Nieuwe Merwede	22 Oct. 2008	51°46'43"	4°45'41"	*Neogobius kessleri*	9
23	Nieuwe Merwede	22 Oct. 2008	51°46'38"	4°45'04"	*Neogobius kessleri*	3
24	Nieuwe Merwede	22 Oct. 2008	51°46'38"	4°44'57"	*Neogobius kessleri*	1
25	Nieuwe Merwede	22 Oct. 2008	51°46'39"	4°45'01"	*Neogobius kessleri*	3
26	Nieuwe Merwede	22 Oct. 2008	51°46'59"	4°45'34"	*Neogobius kessleri*	2
27	Nieuwe Merwede	22 Oct. 2008	51°47'51"	4°48'08"	*Neogobius kessleri*	2
28	Nieuwe Merwede	23 Oct. 2008	51°45'01"	4°44'18"	*Neogobius kessleri*	1
29	Nieuwe Merwede	23 Oct. 2008	51°44'43"	4°43'32"	*Neogobius kessleri*	1
30	Nieuwe Merwede	23 Oct. 2008	51°45'12"	4°43'59"	*Neogobius kessleri*	1
31	Nieuwe Merwede	23 Oct. 2008	51°45'53"	4°47'05"	*Neogobius kessleri*	1
32	Nieuwe Merwede	23 Oct. 2008	51°47'55"	4°46'59"	*Neogobius kessleri*	1
33	Nieuwe Merwede	23 Oct. 2008	51°47'51"	4°47'04"	*Neogobius kessleri*	1
34	Nieuwe Merwede	23 Oct. 2008	51°48'05"	4°48'40"	*Neogobius kessleri*	1
35	Nieuwe Merwede	23 Oct. 2008	51°48'01"	4°48'38"	*Neogobius kessleri*	2
36	Hollands Diep	06 Oct. 2008	51°42'50"	4°38'19"	*Neogobius kessleri*	2
37	Hollands Diep	29 Sept. 2008	51°42'49"	4°38'26"	*Neogobius kessleri*	1
38	Hollands Diep	06 Oct. 2008	51°42'50"	4°38'19"	*Neogobius kessleri*	1
39	Hollands Diep	06 Oct. 2008	51°42'51"	4°38'49"	*Neogobius kessleri*	2